

## CLAIMS

1. A process for the preparation of fludarabine phosphate starting from fludarabine, comprising the following steps: (a) the fludarabine is caused to react with a short-chain trialkyl phosphate and phosphorus oxychloride at a temperature of less than -5° C; (b) an aprotic non-polar organic solvent is added to the mixture so obtained with consequent precipitation of the fludarabine phosphate.
2. A process according to claim 1, characterized in that the starting fludarabine has a water content, measured in accordance with the Karl Fischer (K.F.) method, of not more than 0.5%.
3. A process according to claim 1, characterized in that the short-chain trialkyl phosphate is a compound of the formula  $(RO)_3PO$  wherein R is an alkyl radical having from 1 to 4 carbon atoms.
4. A process according to claim 1, characterized in that the trialkyl phosphate is selected from trimethyl phosphate and triethyl phosphate, preferably triethyl phosphate.
5. A process according to any one of the preceding claims, characterized in that the trialkyl phosphate is used in an amount of from 5 to 8 moles, preferably from 6 to 7 moles, per mole of fludarabine.
6. A process according to any one of the preceding claims, characterized in that the phosphorus oxychloride is used in an amount of from 1 to 4 moles, preferably from 2 to 3 moles, per mole of fludarabine.
7. A process according to any one of the preceding claims, characterized in that the aprotic non-polar organic solvent is a hydrocarbon solvent.
8. A process according to any one of the preceding claims, characterized in that the aprotic non-polar organic solvent is toluene.
9. A process according to any one of the preceding claims, characterized in that the aprotic non-polar organic solvent is added at a temperature of less than -5° C.
10. A process according to any one of the preceding claims, characterized in that the aprotic non-polar organic solvent is used in an amount of from 50 to 150 moles, preferably in an amount of from 100 to 110 moles, per mole of

fludarabine.

11. A process according to any one of the preceding claims, characterized in that it is carried out at a temperature of less than  $-10^{\circ}$  C, preferably at a temperature of from  $-10$  to  $-15^{\circ}$  C.